



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/670,975

09/27/2000

Charles E. May

00-140

6488

24319

7590

10/26/2004

LSI LOGIC CORPORATION
1621 BARBER LANE
MS: D-106 LEGAL
MILPITAS, CA 95035

EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 10/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/670,975

Applicant(s)

MAY ET AL.

Examiner

Erik Kielin

Art Unit

2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7-20 is/are pending in the application.
- 4a) Of the above claim(s) 9-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 7 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action responds to the Amendment filed 11 August 2004.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, and 8 rejected under 35 U.S.C. 102(b) as being anticipated by US 5,591,269 (**Arami et al.**).

Regarding claims 1-3, **Arami** discloses a method for controlling a substrate temperature (col. 2, lines 44-47) of a substrate **W** (Fig. 18) during processing of the substrate at a process energy **130, 131, 132**, by controlling a chuck temperature of a chuck (Abstract) on which the substrate resides during the processing, comprising:

circulating a thermal transfer media **115, 151** at a thermal transfer media temperature through the substrate chuck to adjust both the chuck temperature and the substrate temperature, the thermal transfer media circulating at a flow rate (Fig. 18; col. 16, lines 29-48);

sensing the chuck temperature from three chuck temperature sensing locations **152, 153, 154** within the chuck -- as further limited by instant claims 2 and 3 (Fig. 18);

reporting the sensed chuck temperature to a controller **119**, where the controller is operable to adjust the process energy **130, 131, 132** and the thermal transfer media flow rate and the thermal transfer media temperature (col. 9, lines 11-24); and

when the sensed chuck temperature is outside of a desired temperature range, then using the controller to first adjust at least one of the thermal transfer media flow rate, the thermal transfer media temperature, and the process energy to bring the sensed chuck temperature within the desired temperature range (col. 9, lines 11-24). Because the chuck reaches the desired temperature, the process energy does not have to be changed.

Regarding claim 4, the temperature sensor 155 is disposed “on a surface” of the chuck (Fig. 21). In order for the sensor to in the chuck, the sensor must be in contact with “a” surface of the chuck. Therefore the literal meaning of the limitation is met.

Regarding claim 5, the method of claim 1 wherein the desired temperature range is between about fifty centigrade and about five hundred centigrade (col. 18, lines 3-12).

Regarding claims 7 and 8, the controller is used to the thermal transfer media flow rate and the thermal transfer media temperature and the process energy to heat and cool the chuck and the substrate and thereby to bring the sensed temperature within the desired temperature range (col. 9, lines 11-24). While **Arami** does not indicate if the thermal transfer media flow rate or the thermal transfer media temperature is adjusted first, it has been held that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Claims 7 and 8, as well as the specification, suggest there exists no criticality as to whether the flow rate or the temperature of the thermal transfer media is first adjusted.

3. Claims 1, 3, 4, 7, and 8 rejected under 35 U.S.C. 102(b) as being anticipated by US 5,435,379 (**Moslehi et al.**).

Regarding claims 1 and 3, **Moslehi** discloses a method for controlling a substrate temperature (Abstract) of a substrate **19** (Fig. 3) during processing of the substrate at a process energy (col. 3, 14-27) by controlling a chuck temperature of a chuck (Abstract) on which the substrate **19** resides during the processing, comprising:

circulating a thermal transfer media **22** at a thermal transfer media temperature through the substrate chuck **18** to adjust both the chuck temperature and the substrate temperature, the thermal transfer media circulating at a flow rate (Fig. 3; col. 3, line 42 to col. 4, line 7);

sensing the chuck temperature from at least one chuck temperature sensor **48** within the chuck **18** -- as further limited by instant claims 3 (Fig. 3);

reporting the sensed chuck temperature to a controller **50**, where the controller is operable to adjust at least one of the thermal transfer media flow rate and the thermal transfer media temperature (Fig. 4; col. 3, line 42 to col. 4, line 7; col. 4, lines 39-56); and

when the sensed chuck temperature is outside of a desired temperature range, then using the controller to first adjust at least one of the thermal transfer media flow rate, the thermal transfer media temperature, to bring the sensed chuck temperature within the desired temperature range (col. 3, line 42 to col. 4, line 7; col. 4, lines 39-56). Because the chuck reaches the desired temperature, the process energy does not have to be changed.

Regarding claim 4, the temperature sensor **48** is disposed "on a surface" of the chuck (Fig. 21). In order for the sensor to be in the chuck, the sensor must be in contact with or on "a" surface of the chuck. Therefore the literal meaning of the limitation is met.

Regarding claims 7 and 8, the controller is used to the thermal transfer media flow rate and the thermal transfer media temperature and the process energy to heat and cool the chuck

Art Unit: 2813

and the substrate and thereby to bring the sensed temperature within the desired temperature range (Abstract; col. 3, line 42 to col. 4, line 7; col. 4, lines 35-56; col. 9, lines 43-54). While **Moslehi** does not indicate if the thermal transfer media flow rate or the thermal transfer media temperature is adjusted first, giving however examples wherein both are adjusted, it has been held that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Claims 7 and 8, as well as the specification, suggest there exists no criticality as to whether the flow rate or the temperature of the thermal transfer media is first adjusted.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,605,600 (**Muller et al.**) in view of **Arami**.

Regarding claims 1-3, **Muller** discloses a method for controlling a substrate temperature (col. 1, lines 43-55) of a substrate **104** (Fig. 4) during processing of the substrate at a process energy ("RF power" for etching; col. 2, lines 7-26), by controlling a chuck temperature of a chuck **105** on which the substrate resides during the processing, comprising:

circulating a thermal transfer media at a thermal transfer media temperature through the substrate chuck to adjust both the chuck temperature and the substrate temperature, the thermal transfer media circulating at a flow rate (col. 1, line 56 to col. 2, line 6; col. 2, lines 27-41);

sensing the wafer temperature from at least one wafer temperature sensing location at the chuck, (Fig. 3);

reporting the sensed chuck temperature to a controller, where the controller is operable to adjust the process energy and at least one of the thermal transfer media flow rate and the thermal transfer media temperature (col. 5, lines 54-59; col. 7, lines 47-54); and

when the sensed chuck temperature is outside of a desired temperature range, then using the controller to adjust at least one of the thermal transfer media flow rate, the thermal transfer media temperature, and the process energy to bring the sensed chuck temperature within the desired temperature range (col. 5, lines 54-59; paragraph bridging cols. 5-6; col. 7, lines 47-54). Because the chuck reaches the desired temperature, the process energy does not have to be changed.

While **Muller** is silent to means of sensing the temperature of the wafer, **Arami**, as noted above, discloses an electrostatic chuck for controlling the temperature of a semiconductor wafer and teaches the benefits of measuring the wafer temperature using three locations from within the chuck in order to get better uniformity and control of the wafer temperature (Arami, col. 2, lines 44-47).

It would have been obvious for one of ordinary skill in the art, at the time of the invention to measure the temperature of the chuck from three locations within the chuck in the method of

Muller, in order to obtain more thorough information of the wafer temperature for better control of the process, as taught by **Arami**.

Regarding claim 5, **Muller** discloses that an exemplary desired temperature range is 145 °C (col. 3, lines 48-52), which is between about 50 °C and about 500 °C.

Regarding claims 7 and 8, the controller is used to the thermal transfer media flow rate and the thermal transfer media temperature and the process energy to heat and cool the chuck and the substrate and thereby to bring the sensed temperature within the desired temperature range (col. 9, lines 11-24). While **Muller** does not indicate if the thermal transfer media flow rate or the thermal transfer media temperature is adjusted first, it has been held that the selection of any order of performing process steps is *prima facie* obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946). Claims 7 and 8, as well as the specification, suggest there exists no criticality as to whether the flow rate or the temperature of the thermal transfer media is first adjusted.

Response to Arguments

6. Applicant's arguments filed 11 August 2004 have been fully considered but they are not persuasive.

In the paragraph bridging pages 7 and 8 of the Response filed 11 August 2004, Applicant argues that Examiner has somehow defined the term "process energy." Examiner respectfully disagrees. Rather it is Applicant who is attempting to selectively define "process energy" to be limited to that which is in the specification, without reciting such limitations in the claims. Applicant's very explanation only demonstrates that Examiner, by contrast, has given the

broadest, reasonable interpretation to “process energy,” as required by precedent. Should Applicant wish the term “process energy” to be limited to that in the specification, then such limitations must be incorporated into the claim language. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further in this regard, as stated by the court in *In re Hiniker Co.*, 150 F.3d 1362, 1369, 47 USPQ2d -523, 1529 (Fed. Cir. 1998) “[t]he name of the game is the claim.” Claims will be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not to be read into the claims. *In re Enter*, 756 F.2d 852, 858, 225 USPQ 1, 5 (Fed. Cir. 1985). Claim interpretation must begin with the language of the claim itself. See *Smithkline Diagnostics, Inc. v. Helena Laboratories Corp.*, 859 F.2d 878, 882, 8 USPQ2d 1468, 1472 (Fed. Cir. 1988). See also *Yale Lock Mfg. Co. v. Greenleaf*, 117 U.S. 554, 559 (1886) (“The scope of letters patent must be limited to the invention covered by the claim, and while the claim may be illustrated it cannot be enlarged by language used in other parts of the specification.”); *Autogiro Co. of Am. v. United States*, 384 F.2d 391, 396, 155 USPQ 697, 701 (Ct. Cl. 1967) (“Courts can neither broaden nor narrow the claims to give the patentee something different than what he has set forth [in the claim].”). See also *Continental Paper Bag Co. v. Eastern Paper Bag Co.*, 210 U.S. 405, 419 (1908); *Cimiotti Unhairing Co. v. American Fur Ref. Co.*, 198 U.S. 399, 410 (1905). Accordingly, “resort must be had in the first instance to the words of the claim” and words “will be given their ordinary and accustomed meaning, unless it appears that the inventor used them differently.” *Envirotech Corp. v. Al George, Inc.*, 730 F.2d 753, 759, 221 USPQ 473, 477 (Fed. Cir. 1984). The general claim construction principle that

limitations found only in the specification of a patent or patent application should not be imported or read into a claim must be followed. See *In re Priest*, 582 F.2d 33, 37, 199 USPQ 11, 15 (CCPA 1978).

On page 8 of the Response, under the section entitled "Claim Rejections Under § 102" first paragraph, Applicant argues that the method in the applied art must recited steps that are only optionally performed. If the chuck temperature is in the desired range then the steps performed only if the chuck is outside the temperature range are never performed; therefore, there exists no requirement for such method steps in the applied art if they are not performed.

In the next paragraph, Applicant argues that a controller must perform controlling of each of the temperature and flow rates of the thermal transfer media as well as the "process energy" in order to anticipate the method. While neither agreeing nor disagreeing with Applicant's comment in this regard, note it has been held that to be entitled to weight in method claims, the recited structure limitations therein must affect the method in a manipulative sense, and not amount to the mere claiming of a use of a particular structure. *Ex parte Pfeiffer*, 1962, C.D. 408 (1961). By precedent then, so long as each of the temperature and flow rates of the thermal transfer media and the "process energy" are controlled, it does not matter if a "controller" is used.

Applicant argues on p. 9, first full paragraph, that for the method to be properly anticipated, the art must recited the capacity to do all of the steps whether or not they are actually performed. Examiner respectfully disagrees. While this may be the case for a software program, Examiner respectfully submits it is not the case for a method. If the method only optionally

Art Unit: 2813

performs a given step, then there exist instances wherein the step is not performed and applied art that does not perform the step still anticipates the claim.

Applicant appears to argue that Arami does not disclose a controller which controls the transfer media temperature and flow rate and the process energy. Examiner respectfully disagrees. Arami shows such a controller **119** in Fig. 18 as has been pointed out in all three Office actions. Accordingly this argument appears to be in error. In this regard, Applicant argues that 130, 131, and 132 are not process energy. Examiner respectfully disagrees. They --in fact-- are. Heat cannot be created absent energy to do so. Since this energy to heat is part of the process, it is, by definition, process energy.

Applicant appears to make the same arguments regarding the Moslehi reference, as made for the Arami reference. Again Examiner respectfully disagrees and uses the same arguments as applied to Arami. Moslehi teaches a temperature controller **50** (Fig. 3) which adjusts thermal transfer media flow rate and temperature, also controls process energy for the same reasons as indicated previously.

Applicant appears to make the same arguments regarding the Muller reference, as made for the Arami and Moslehi references. Examiner respectfully disagrees. Muller cannot control the temperature of the substrate absent a control system for so doing. Muller teaches controlling the cathode temperature to control the wafer temperature and controlling the process power via ion bombardment to control the wafer temperature. (See locations in Muller as noted in the rejection of the claims.)

Applicant argues that the decision tree as recited in claim 1 has patentable weight and distinguishes the instant claims over each of applied references of Arami, Moslehi, and Muller in

view of Arami. Examiner respectfully disagrees. The decision tree has patentable weight only to the extent that process steps are **not optional**.

On pages 10-12 of the Response, under the section entitled, "Claim Rejections under §103," Applicant argues that the combined references do not teach or suggest the claim limitations for those same reasons presented in response to the art applied under §102. Examiner respectfully disagrees for reasons presented in the rejection claims, above.

On page 12 of the Response, under the section entitled "Entry of Prior Amendments Before Filing of RCE" Applicant alleges,

"Applicants are, therefore, surprised that the examiner apparently has not done any additional searching, and has instead relied on the same rejections as previously made. In fact, the language of the examiner's rejections in the present office action are nearly verbatim those made in the prior office action. Applicant's assert that *any* amendment would require some amount of further consideration, and that an assertion that further consideration is required is not a justifiable reason for requiring an RCE to be filed. Applicants respectfully requires that the examiner please be more mindful in the future of the waste of resources that such decisions create. Patents are already outside of the financial reach of many inventors, and such decisions only make the acquisition of a patent further cost prohibitive." (Emphasis in original.)

Applicant's comments are acknowledged. Examiner *did* do additional searching. Examiner additionally addressed Applicant's arguments. Examiner additionally addressed the amendments to the claims. Furthermore, additional searching does not necessarily imply better art will be uncovered than that presently of record; therefore, new rejections would not necessarily follow. Accordingly, Applicant's assertion is clearly illogical. There is no reason for the Office to abandon rejections which teach the claimed invention simply because additional searching is done.

The amendment was filed **after** the Office action made final. Any amendment considered after such final actions is a courtesy and is not entered as a matter of right. See MPEP 706.07(f).

Additionally, the fee for filing a RCE is \$770 for a large entity. Examiner respectfully submits that this additional cost is hardly “outside of the financial reach of many inventors,” and is hardly “cost prohibitive” --especially for large entities such as the present and especially given that a patent entitles its owner to a limited 20-year monopoly whose benefits surely returns more than the costs required by the *USPTO*. Otherwise, no one would go to the expense to apply for a patent in the first place. Examiner respectfully submits that the Office cannot operate on zero dollars any more than can Applicant or his/her Representatives. Accordingly additional work (e.g. amendments filed **after** final) requires additional fees.

Regarding Applicant's comment,

“Applicants assert that *any* amendment would require some amount of further consideration, and that an assertion that further consideration is required is not a justifiable reason for requiring an RCE to be filed.”

It is Applicant's *decision* --not the Office's *requirement*-- that a RCE be filed. Applicant is never *required* to file a RCE. Applicant can appeal the decision of Examiner to the BPAI or abandon the application; neither requires filing an RCE. See MPEP 706.07(f).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

Art Unit: 2813

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 571-272-1693. The examiner can normally be reached on 9:00 - 19:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Erik Kielin
Primary Examiner
25 October 2004